

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for manufacturing a waveguide in a circuit structure using a multilayer ceramic technique, wherein said circuit structure is assembled of separate layers of ceramic, said ceramic having a permittivity ϵ_r which is higher than the corresponding value of air, and wherein, in said multilayer ceramic technique, layers, cavities, and holes are made in the ceramic layers and a conductive layer of material is silk screen printed on a ceramic layer, and the circuit structure is completed by exposing the circuit structure to a high temperature, said method comprising the steps of:

forming two air-filled channels extending the length of the waveguide, wherein a core of the waveguide is defined between said two air-filled channels;

forming essentially parallel first and second planes of conductive material above and below the core part of the waveguide, wherein said ~~[conductive]~~ first and second conductive planes define a top and a bottom of the core of the waveguide, and wherein said ~~[conductive]~~ first and second conductive planes are defined between said two air-filled channels.

2. (Previously Amended) The waveguide manufacturing method according to claim 1, further comprising the step of:

forming at least one row of vias in the core part of the waveguide, wherein said at least one row of vias is positioned close to one of the air-filled channels and each via in the at least one row of vias is filled with conductive material whereby said first and second planes of conductive material are galvanically connected.

3. (Currently Amended) A waveguide integrated into a circuit unit manufactured with a multilayer ceramic technique, wherein the circuit unit has been assembled of separate layers of ceramic, wherein a permittivity ϵ_r of the ceramic is higher than the corresponding permittivity value of air, and wherein, in said multilayer ceramics technique, layers, cavities, and holes are made in the ceramic layers, and a layer of conductive material is made on a ceramic layer, said waveguide comprising:

a core part defined by:

two air-filled channels extending the length of the sides of the waveguide core;

a bottom layer of conductive material extending the length of the bottom of the waveguide core; and

a top layer of conductive material extending the length of the top of the waveguide core, wherein said top and bottom layers are essentially parallel, wherein said top and bottom layers are defined between said two air-filled channels.

4. (Previously Presented) The waveguide according to claim 3, wherein said waveguide core further comprises:

at least one row of vias filled with conductive material and positioned close to one of the air-filled channels, whereby said vias galvanically connect said top and bottom layers.

5. (Currently Amended) The waveguide according to claim 3, wherein a hole is disposed [~~made~~] in the top layer of conductive material to thereby excite an electromagnetic field intended to propagate in the waveguide core.

6. (Currently Amended) The waveguide according to claim 4, wherein a hole is disposed [~~made~~] in the top layer of conductive material, and wherein said hole is fitted with a probe leading to the waveguide core to thereby excite an electromagnetic field intended to propagate in the waveguide.

7. (Previously Presented) The waveguide according to claim 3, wherein a hole is made in the top layer of conductive material, and wherein said hole is fitted with a coupling loop leading to the waveguide core to thereby excite an electromagnetic field intended to propagate in the waveguide.

8. (Currently Amended) The waveguide manufacturing method according to claim 1, wherein the multilayer ceramic technique is one of High Temperature Cofired Ceramics (HTCC) and ~~[or]~~ Low Temperature Cofired Ceramics (LTCC)

9. (Previously Presented) The waveguide manufacturing method according to claim 1, wherein a width of each of the two air-filled channels is substantially one-fourth of a wavelength of a cutoff frequency of the waveguide.

10. (Previously Presented) The waveguide manufacturing method according to claim 1, wherein a waveform that can propagate in the direction of the length of the waveguide is one of a transverse-electric or transverse-magnetic waveform.

11. (Previously Presented) The waveguide manufacturing method according to claim 1, wherein an interface between the waveguide core and air in the two air-filled channels form a discontinuity of the characteristic impedance of the waveguide core.

12. (Currently Amended) The waveguide manufacturing method according to claim 1, wherein ~~[most of]~~ the ceramic structure is comprised substantially of ~~[comprising]~~ the same ceramic material ~~[structure has same permittivity]~~.

13. (Previously Presented) The waveguide manufacturing method according to claim 1, wherein the essentially parallel first and second planes of conductive material either (i) substantially cover the surface of the core part of the waveguide or (ii) are partly gridded.

14. (Previously Presented) The waveguide manufacturing method according to claim 2, wherein the step of forming at least one row of vias in the core part of the waveguide comprises the steps of:

forming a first row of vias in the core part of the waveguide, wherein said first row of vias is positioned close to a first air-filled channel of the two air-filled channels; and

forming a second row of vias in the core part of the waveguide, wherein said second row of vias is positioned close to a second air-filled channel of the two air-filled channels.

15. (Previously Presented) The waveguide manufacturing method according to claim 14, wherein the step of forming at least one row of vias in the core part of the waveguide further comprises the step of:

forming a third row of vias in the core part of the waveguide.

16. (Currently Amended) The waveguide manufacturing method according to claim 1, wherein the waveguide core is defined between the two air-filled channels and two remaining portions of ceramic material are defined outside the two air-filled channels, the method further comprising the step of:

forming at least one row of vias in one of the two [a] remaining portion of ceramic material [~~in the waveguide, said remaining portion being on the other side of one of the two air-filled channels from the waveguide core~~].

17. (Previously Presented) The waveguide manufacturing method according to claim 1, further comprising the step of:

forming a quarter-wave transformer at an end of the waveguide core where a signal is fed into the waveguide core.

18. (Currently Amended) A method for manufacturing a waveguide using a multilayer ceramic manufacturing technique, comprising the steps of:

forming two air-filled channels extending the length of the waveguide, whereby a waveguide core is defined between said two air-filled channels and two remaining waveguide portions are defined outside said two air-filled channels, wherein the waveguide core and the two remaining waveguide portions comprise ceramic material having the same permittivity, and wherein said same permittivity is greater than the permittivity of air;

forming a bottom surface of conductive material under the waveguide core, wherein said bottom surface does not extend over the remaining waveguide portions; and

forming a top surface of conductive material on the waveguide core, wherein said top surface does not extend over the remaining waveguide portions, wherein said top and bottom surfaces are substantially parallel planes.

19. (Previously Presented) The method according to claim 18, further comprising the steps of:

forming a first row of vias in the waveguide core, wherein said first row of vias is positioned close to a first air-filled channel of the two air-filled channels; and

forming a second row of vias in the waveguide core, wherein said second row of vias is positioned close to a second air-filled channel of the two air-filled channels.

20. (Previously Presented) The method according to claim 18, further comprising the step of:

forming a quarter-wave transformer at an end of the waveguide core where a signal is fed into the waveguide core.